

## **Abstract of the Disclosure**

An embodiment of this invention pertains to a fully integrated, highly linear, and power-efficient balun circuit and voltage-to-current converter that interfaces a single-ended low noise amplifier ("LNA") and a differential mixer. The balun circuit includes components that perform the following functions: provide a load element for the LNA, resonate at the desired frequency of operation to maximize a gain of a single-ended signal output from the single-ended LNA, stabilize the gain of the single-ended signal; convert the single-ended signal to a differential signal, match the impedance between the single-ended LNA and the differential mixer to maximize the power transfer of the differential signal, improve the balance of the differential signal, provide a bias to the LNA, provide a bias for a voltage-to-current converter portion of the differential mixer, and differentially drive a pair of grounded source transistors that linearly convert the differential signal in voltage form to current form. The voltage to current conversion occurs without using a current source in the voltage-to-current converter portion of the differential mixer.

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